it is most difficult to distinguish the results of crushing and disintegration from actual specific characters; and even in a formation so little disturbed as the black Triassic shale in which these fishes are entombed, the apparent form of the head and trunk cannot always be relied upon in specific diagnoses.

Ischypterus is undoubtedly identical with *Semionotus*, as Dr. Newberry suspects, and is thus represented both in America, Europe, and South Africa. Ichthyologists will doubtless also agree with the systematic position in which the author places the genus. To us, however, it appears that this determination was more conclusively proved by the researches of Dr. Traquair in 1877, when he offered to the Geological Society some detailed remarks on the osteology of the fish; and on that occasion the intimate connection between *Ischypterus* and *Semionotus* was equally pointed out. Each of the species is illustrated by at least one figure, and good reason is given for assigning to one of the larger forms the supposed fragment of a *Tetragonolepis*, brought from Virginia by Lyell.

Catopterus and *Dictyopyge* are retained as distinct genera, in accordance with the usual custom; and then follow two interesting types which the author himself has added to the list. A very distinct species of *Ptycholepis* is described from Durham, Conn., and an equally peculiar species of *Acentrophorus* is made known from the Chicopee Falls, Mass. Of these genera, the first has hitherto been known chiefly from the English and German Lias, though also rarely obtained from the Austrian Keuper; while the second has previously been found only in the Permian magnesian limestone and marl slate of Durham, England.

A preliminary definition of the Cœlacanth fish *Diplurus longicaudatus* was given by Dr. Newberry several years ago; and the detailed description and figure now published are a welcome addition to our knowledge of the group to which the fish belongs. The finest specimen is nearly complete, and is only disappointing in the matter of cranial osteology. The largest specimen discovered measured about three feet in length, thus exceeding in size any Cœlacanth hitherto met with below the Jurassic.

The third portion of the memoir deals with the fossil plants, only seventeen species of which have been brought together. These confirm the views of Saporta as to the infra-lias, or, at most, Keuper, age of the formation, arrived at from a study of the far more important series described by Fontaine in the sixth monograph of the Survey, issued in 1883; a series procured from the coal-bearing outliers of the same age in Virginia and Carolina.

Of plants common to the Rhætic of Europe we have *Clathropteris platyphylla*, *Cheirolepis Münsteri*, *Otozamites latior*, *O. brevifolius*, two species of *Pachyphyllum* hardly separable from *P. peregrinum*, *Equisetum Rogersi*, claimed by Saporta to be identical with *E. arenaceum*, and the doubtful stems well known in many Triassic rocks, sometimes referred to Calamites, but here referred to *Equisetum Meriani*, Brong., and *Schizoneura*.

Among the novelties is *Dendrophycus triassicus*, a supposed algoid with a cabbage-like leaf destitute of transverse nerves. From the fact that there is in the British Museum an identical structure, from a gritty Tertiary limestone of Mull, which can hardly be organic, we should question the vegetable nature of this fossil, without, however, being able to suggest any other plausible origin. There is a new Cycadinocarpus, founded on a compressed cycas-looking nut, possibly the fruit of one of the Otozamites; and the obscure plant, referred to by Fontaine under the misleading name of *Bambusium Carolinense*, now called *Zoperia simplex*. Whether, as suggested by the author, this may prove to be an aquatic Monocotyledon—"a kind of gigantic Schollera"—there are no sufficient materials for discussing. It is somewhat surprising to find *Baiera Münsteriana* located among the Cryptogams, as there are so many forms connecting it with Ginkgo, all possessing the remarkable twin fibro-vascular bundles in the petiole which result in the symmetrically cleft leaf, that its position is scarcely doubtful. We prefer that the Cycads should precede the Conifers, but in so small an assemblage of species, their want of arrangement is of no great importance.

A. S. W. AND J. S. G.

SEA ANEMONES OF THE NORTH ATLANTIC.

Den Norske Nordhavs-Expedition, 1876–1878. *XIX. Zoologi: Actinida.* Ved D. C. Danielssen. Med 25 Plader og 1 Kart. (Christiania: Grondahl and Son's Bogtrykkerl, 1890.)

ANOTHER part of the General Report of the Norwegian North Atlantic Expedition has just been published, containing a memoir on the Actinida of the North Atlantic, by D. C. Danielssen. It will be remembered that this fine series of memoirs is published under the sanction of the Norwegian Government, and with some assistance from their Treasury. They have been distributed to very many of the Academies and learned Societies of the world, and reflect immense credit on the zeal and intelligence of the Norwegian naturalists.

All the specimens described by Dr. D. C. Danielssen in this memoir were collected from deep water, and most of them from the "cold area." These anemones, for the greater part, proved capable of accommodating themselves to changes of habit and temperature, and it was therefore possible to keep them alive for a considerable period, during which their external characteristics were observed and their portraits taken. That, despite the heavy rolling sea so generally met with in the North Atlantic, the artist has done his part well, is proved by a glance at the first five plates which accompany this memoir, which have been printed in colours by Werner and Winter, of Frankfort-on-the-Main.

This memoir represents the first serious attempt, since the publication of Richard Hertwig's Report on the *Challenger* Actinaria, to describe the sea anemones of an extended area, taking their anatomical features as the basis of their classification; and it seems to us to justify the remark that a very much larger series of facts must be noted before an even fairly plausible scheme of classification of this group can be formulated. No doubt the systems of Gosse and Andrès, based for the most part on mere external characteristics, have had their day; but no new scheme to take their place has yet been properly developed; a wider and closer anatomical investigation of even well-known species must be undertaken ere this can be looked for.

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Perhaps this will in some measure account for the fact that of the Actiniæ collected during the expedition, thirty-nine out of forty-one are described as new species, for which eighteen new genera are diagnosed, and five new families are formed. The large majority of these new forms belong, as might be expected, to the Hexactiniæ of Hertwig, but some belong to the Edwardsiæ, Zoantheæ, and Ceriantheæ; while a new tribe has been provisionally made to receive two forms (Fenja and Ægir), not at first sight clearly appertaining to the Actinaria. These forms have elongated, cylindrical, vermiform bodies, with an apparently complete body cavity; the oral disk is surrounded with tentacles, and opens into an œsophagus, which is continued into a closed intestine, which opens at the aboral end of the body. There are twelve septal chambers, complete in themselves, with twelve pore openings around the anal opening.

In *Fenja mirabilis* the body is 70 mm. in length and 15 mm. in breadth at the anterior extremity, whilst the posterior part is rather narrower; the surface of the body is smooth and shining.

In *Ægir frigidus* the animal is surrounded with a mucous investment, and the body is but 30 mm. in length; from 8 to 10 mm. in breadth at the anterior extremity, to 4 to 5 mm. in breadth at the somewhat rounded posterior extremity. While in Fenja the ovaries do not materially differ from the type in the Actinida, those in Ægir greatly approach the form generally met with in the Alcyonida.

It would seem useless to speculate as to the position these strange forms must occupy until something more is known of their structure and something of their development. Dr. Danielssen writes that, if the cœlom is to be regarded as the distinctive feature, then it is evident they cannot be placed among the Cœlenterata; but he adds that perhaps too much stress has been laid on the so-called gastro-vascular apparatus as a systematic feature in this group, and that what is called the œsophagus in Actinida is possibly a rudimentary intestinal formation.

We have alluded to these two forms in some detail as being of very special interest, but an almost equal interest attaches to others which are also to be found described, but which our space forbids us to do more than thus generally refer to. In addition to the coloured plates representing the new species, there are nineteen with the various anatomical details, making this memoir one of the best illustrated of the series. It follows so closely on the memoir on the Alcyonida by the same distinguished author, that we cannot but express our admiration for the energy he displays in working out the natural history of the Norwegian coast, which is now better known than that of our own shores.

OUR BOOK SHELF.

Smithsonian Report, 1887. (Washington: Government Printing Office.)

THIS important publication is increasing year by year in value, in consequence of the pains taken to increase the quantity and quality of the records of progress in the various sciences. In the present volume it brings the records of the Institution down to June 30, 1887. We find the proceedings of the Board of Regents and of the Executive Committee, the Report of the Secretary on the general work of the establishment, the National Museum, and the Bureau of Ethnology. But there is very much more than this, although these matters are by no means of merely local interest. The progress of astronomy, North American geology and palæontology, vulcanology and seismology, geography and exploration, physics, chemistry, mineralogy, zoology, and anthropology, take up no less than 500 pages, and are admirably done. We should add that the record of each branch of science is accompanied by a full bibliography, which largely increases its usefulness. The miscellaneous papers this year deal chiefly with the Western mounds and Indian archæology.

Travels and Discoveries in North and Central Africa. By Henry Barth. (London: Ward, Lock, and Co., 1890.)

FORTY years ago Barth was invited to join a mission which the British Government was about to despatch to Central Africa. He accepted the invitation, and was absent from Europe nearly six years, in the course of which he travelled from Tripoli to Bórnu, and from Bórnu to Timbúktu. The account of his explorations, published in 1857 in German and English, was immediately recognized as one of the most important and fascinating of modern books of travel; and even now, after so long an interval, it has lost but little of its interest. In the present volume, which belongs to the Minerva Library, the first half of the great traveller's elaborate work is reproduced with many of the original illustrations. The books of travel by Darwin and Wallace, which have been reissued in the same series, differ considerably from that of Barth, who was not a naturalist; but, as Mr. Bettany, the editor, says, "to make up for this he is extremely rich in topographical, historical, and anthropological details." Mr. Bettany contributes to the volume a short introduction, in which he brings together some of the leading facts relating to Barth's career.

Weather Forecasting for the British Islands. By Captain Henry Toynbee, F.R.A.S., &c. (London: Edward Stanford, 1890.)

THIS is a most interesting and useful little book, and should be in the possession of all those who take any interest whatever in weather forecasting. It is written with the intention of showing what a single observer can do as regards this subject, supposing him to have a barometer, means for observing roughly the direction and force of the wind, and power to recognize cirrus clouds and the direction from which they are coming. To make the book more complete, the author has added some daily weather charts to illustrate the application of the principles and variations which occur in practice, and to show what can be learnt from them.

The Encyclopædia of Photography. By Walter E. Woodbury. (London: Iliffe and Son, 1890.)

THIS is the second part of the work we noticed before, to be completed in about twelve parts issued monthly. The ground covered is from B to Coffee Process, between which entries will be found information useful to all classes of photographers. Bromide paper, camera-bellows making, carbon process, may be mentioned as among the subjects most fully treated of. When completed, the work will contain over 1000 references, and be illustrated by about 200 explanatory sketches and diagrams by the author.

Japan and the Pacific. By Manjiro Inagaki, B.A. (Cantab.). (London: T. Fisher Unwin, 1890.)

THIS book, so far as it has any elements of interest, appeals rather to politicians than to students of science.

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